

## Ten new species of parasitoid wasps *Mnioes* Townes, 1946 (Hymenoptera: Ichneumonidae: Banchinae) described from Peru

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### Abstract

*Mnioes* Townes is a predominantly Neotropical genus of the family Ichneumonidae, mainly documented from Central America and, until now, with no described species from South America. In this paper, ten new species are described from Peru: *Mnioes attenboroughi* sp. nov., *M. huk* sp. nov., *M. ishay* sp. nov., *M. kinsa* sp. nov., *M. pisqa* sp. nov., *M. poncei* sp. nov., *M. pusaq* sp. nov., *M. qanchis* sp. nov., *M. soqta* sp. nov., and *M. tawa* sp. nov. A key to the Peruvian species and maps of their geographical distribution are also presented.

**Key words:** Ichneumonoidea, taxonomy, parasitoids, wasps, Neotropical

### Introduction

The fauna of Banchinae in Peru is understudied. Thirteen genera known (Alvarado *et al.* 2010, Broad *et al.* 2011), however, only four of these comprise species described from Peru, *Hapsinotus* Townes, 1970, *Meniscomorpha* Schmiedeknecht, 1907, *Occia* Tosquinet, 1903, and *Terrylee* Broad *et al.*, 2011 (Alvarado *et al.* 2018, Broad *et al.* 2011, Yu *et al.* 2012). Recently, *Hapsinotus* was reviewed (Alvarado *et al.* 2018) with 15 Peruvian species described. Since only one species was previously recorded in the literature; those results suggest that the Peruvian fauna is far from being well known.

Among the poorly studied genera is *Mnioes* Townes, 1946, a predominantly Neotropical genus which contains 16 described species; its highest species richness is in Central America (Ugalde-Gómez and Gauld 2002), and with one species found in the Nearctic region (Townes 1970, Ugalde-Gómez and Gauld 2002). This genus has no records from South America, although undescribed species are known from Peru (Alvarado *et al.* 2010).

The aim of this paper is to describe and illustrate ten new species of *Mnioes*, and to provide a key to all species occurring in Peru.

### Material and methods

All specimens studied are deposited at the Museo de Historia Natural, Universidad Nacional Mayor de San Marcos, Lima, Peru (MUSM) and Snow Entomological Museum Collection, Kansas, USA (SEMC).

Morphological terminology and the style of descriptions follow Ugalde-Gómez and Gauld (2002) and Alvarado *et al.* (2018). Measurements and biometric ratios used in descriptions are as follows: clypeus measured in frontal view; face maximum width/maximum height measured in frontal view, at the antennal socket level; antennomeres measured in lateral view, maximum width measured at distal end; first two metasomal tergites maximum length/maximum width measured in dorsal view; ovipositor sheath length/hind tibia length measured in lateral view. All measurements were taken with an ocular micrometer. Microphotographs were prepared using a Canon 7D digital camera attached to an Infinity K-2 long distance microscopic lens, in the laboratories of the SEMC.

Collecting data for holotypes is given *verbatim* but modified for the paratypes as follows: first political divi-

sion (department) in capitals, followed by province, district, and specific locality; different collecting events are separated by semicolons and, the collecting methods, if mentioned in the label, are abbreviated: Malaise trap (MT), yellow pan trap (YPT), and flight intersection trap (FIT). Distribution maps were prepared using SimpleMapper (Shorthouse 2010), based on specimen label data.

## Systematics

### *Mnioes* Townes, 1946

*Mnioes* Townes, 1946: 58. Type-species *Lampronota jacunda* Cresson, 1874, by original designation.

**Diagnosis.** *Mnioes* can be distinguished from all other genera of Atrophini by the combination of the following characters: (1) sculpture of the body, usually, granulate and matte; (2) outer surface of mandible, close to the base of upper tooth, convex and polished (Fig. 5B); (3) clypeus basally convex, apically weakly sclerotized and, at least medially, concave (Figs 1C, 2C); (4) clypeal margin truncate to concave medially (Fig. 2B); (5) frons weakly biconcave, granulate, without ornamentations; (6) flagellum, usually (except *Mnioes iskay* **sp. nov.**), centrally white- or yellow-banded; (7) scape apically truncated, about 60–75° from transverse (Fig. 2C); (8) submetapleural carina narrow, only slightly and evenly broadened anteriorly (Fig. 2D); (9) propodeum (Fig. 1D) without anterior transverse, lateral, and lateromedian longitudinal carinae, posterior transverse carina usually discernible as a vestige at middle (rarely more extensively developed), and pleural carina from absent to strong; (10) fore wing with veins 3rs-m entirely absent, with 2rs-m more than 2.0 times as long as abscissa of M between 2rs-m and 2m-cu, 2m-cu usually with two bullae, bullae separated by a short length vein which often bears a stub of a spurious vein (rarely without this abscissa of 2m-cu thus with a single long bulla); (11) hind wing with length of abscissa of Cu1 between M and Cu-a 0.7–0.9 times as long as the combined lengths this vein and cu-a; (12) tergite I without lateromedian longitudinal carinae (Figs 1D and 3C); and (13) ovipositor sheath 1.6–3.1 times as long as hind tibia.

**Comments.** No other South American country has records of *Mnioes*. The genus ranges from sea-level up to about 3000 meters, with the exception of *Mnioes iskay* **sp. nov.** recorded at about 4000 meters. The peak of diversity occurs between 700 and 1500 meters as found in Costa Rica (Ugalde-Gómez and Gauld 2002).

Several species are widely distributed and commonly collected; although no hosts are known. Banchinae with known host associations are koinobiont endoparasitoids of Lepidoptera larvae (Quicke 2015; Broad *et al.* 2018), and this is also expected to be the case for *Mnioes*.

Sexual dimorphism is mostly evident in the coloration, males in several species are chromatically quite distinct from females, e.g., *M. attenboroughi* **sp. nov.** and *M. tawa* **sp. nov.** In species with similar coloration in both sexes, males generally present the white band starting more apically and covering fewer articles than in females. Additionally, males are usually much smaller than their respective females (Figs 1, 7, 8). This was also noticed for the Central American species (Ugalde-Gómez and Gauld 2002).

### Key to Peruvian species of *Mnioes*

1. Antenna without white- or yellow-band (Fig. 3A); metasomal tergites shiny, weakly granulate (Figs 3A and 3C) ***iskay* sp. nov.**
- . Antenna with white- or yellow-band or with white or yellow colour in some articles of the flagellum; metasomal tergites granulate, matte (Fig. 1D) ..... 2
2. Propodeum and mesoscutum black with white or yellowish spots (Figs 4A and 4C) ..... 3
- . Propodeum and mesoscutum entirely black ..... 4
3. Ovipositor sheath 1.6× as long as metathoracic tibia; metasomal tergite I uniformly red; antenna with scape with truncated sections U-shaped basally (Fig. 4B) ..... ***poncei* sp. nov.**
- . Ovipositor sheath 2.1× as long as metathoracic tibia; metasomal tergite I basally and distally yellow (Fig. 4C); antenna with scape with truncated sections V-shaped basally (as in Fig. 5B) ..... ***kinsa* sp. nov.**
4. Antenna with yellow-band, more than 20 flagellomeres (Fig. 5A) ..... ***pisqa* sp. nov.**
- . Antenna with white- or yellow-band, fewer than 14 flagellomeres ..... 5
5. Metasoma predominantly reddish-brown, at least with tergite IV unicolor reddish-brown ..... 6
- . Metasoma predominantly black, at least with IV unicolor black ..... 8
6. Antennal band ventrally black, dorsally white (Fig. 5C) ..... ***pusaq* sp. nov.**

- . Antennal band with articles evenly coloured ..... 7
- 7. Lower face orbits light yellow (Figs 2B–C); metathoracic tibia evenly black (Fig. 2C). .... *huk* sp. nov.
- . Lower face evenly black; metathoracic tibia reddish yellow, at most basally and distally brownish (Fig. 6). ... *qanchis* sp. nov.
- 8. Fore wing weakly infusate, with a more darkly infumate patches centrally and apically (Fig. 7A–B). .... *soqta* sp. nov.
- . Fore wing hyaline. .... 9
- 9. Female with metathoracic coxa reddish (Fig. 1A and 1D); male with metapleuron black with a whitish cream spot (Fig. 1B) .  
..... *attenboroughi* sp. nov.
- . Female with metathoracic coxa black (Fig. 8A); male with metapleuron reddish with a whitish cream spot (Fig. 8B). ....  
..... *tawa* sp. nov.

### ***Mnioes attenboroughi* sp. nov.**

(Figs 1, 9A)

**Diagnosis.** *Mnioes attenboroughi* sp. nov. can be distinguished from its female congeners by the following combination of traits: frontal orbit white, tegula black, coxae predominantly red, wings hyaline, ovipositor sheath length 2.3–2.5× as long as metathoracic tibia; while the male can be distinguished due its mesoscutum entirely black and wings hyaline. *M. attenboroughi* sp. nov. resembles to *M. tawa* sp. nov. as both have females with mesosoma and metasoma extensively black and wings hyaline; they differ mainly the coloration of the coxae, trochanters and trochantellus predominantly red in *M. attenboroughi* sp. nov. (vs. predominantly black).

**Material examined: Holotype:** ♀ “PERU, MD, Albergue Refugio Amazonas 12°52’30”/69°24’35” 231 m 14.iii.2017 D. Couceiro // WIRED AMAZON PROYECT PAN TRAP” (MUSM).

**Paratypes: CUZCO:** 3♂♂, La Convención, Echarate, 414m, 29.VII.2011, P. Sánchez; 1♂, La Convención, Echarate, Nueva Luz, 11°39’27.7”S/73°1’20”W, 417m 12–14.v.2012, P. Sanchez; 1♀, idem but 11°41’20.7”S/72°56’47”W, 482m, 21.VIII.2013, V. Borda; 1♂, La Convención, Echarate, Saringabeni, 12°12’46.21”S/72°51’48.40”W, 798m, 30.IX.2010, LT, E. Rázuri & C. Espinoza; 1♂, La Convención, Echarate, Túpac Amaru, 11°56’59.13”S/ 72°55’01.18”W, 484m, 15.IX.2010 LT, E. Razuri & C. Espinoza; 1♀, 1♂, La Convención, Echarate, Kitaparay, 12°12’47.73”S/ 72°49’11.42”W, 474m, 11.XI.2009, C. Espinoza & E. Rázuri; 2♀♀, La Convención, Echarate, Quebrada Coentari, 12°10’25”S/ 73°3’56”W, 543m, 7–10.VIII.2011, A. Alfaro; 1♀, idem but 12°10’28”S/ 73°03’55.9”W, 06–08.VIII.2011; 1♀, idem but 12°9’56”S/ 73°4’2.1”W, 614m, 13–16.VII.2011; 1♀, La Convención, Echarate, Pagoneri Norte 11°39’27”S/ 73°1’31”W, 387m, 23–25.XI.2011, P. Sánchez; 2♀♀, La Convención, Echarate, Pagoreni, 11°42’12.8”S/ 72°53’53.1”W, 475m, 13.V.1998, YPT, J. Santisteban; 1♀, La Convención, Echarate, 06.VIII.2011, 503m, P. Sánchez; 1♀, idem but 526m, 30.VII.2011; 1 F, idem but 11°51’29.41”S/72°56’49.92”W, 391m, 24.VIII.2015; 2♀♀, 11°41’20.7”S/ 72°56’47”W, 482m, 21.VIII.2013, V. Borda; 1♀, idem but 11°49’16.4”S/ 73°11’13.4”W, 442m, 24.VIII.2015, M. Pereyra; 1♀, La Convención, Gasoducto TGP, Camisea River, 11°54’28.1”S/ 72°56’03.7”W, 426m, 18.VIII.2009, W. Paredes; 1♀, La Convención, Reserva Comunal Matsigenga, 12°13’31.21”S/ 73°01’59.78”W, 1180m, 1.VIII.2007, A. Asenjo, Premontane forest, FIT; 1♀, La Convención, near Timpia, Shiguaniro river, 12°4’52”S/ 72°48’25”W, 470m 16.x.2010, MT, F. Meza; 1♀, Cashiriari, 11°52’S/ 72°39’W, 579m 31.VIII.1997, MT, Camisea Project; 1♀, San Martin, 7.XI.1997, 474m, 11°47’S/72°42’W, MP, Camisea Project”, 1♀, La Convención, 12°05’7.75”S/ 73°03’08.06”W, 640m, 22.IV.2007, F. Azorsa, low hills forest, YPT; 1♂, Reserva Comunal Amarakaeri, 12°58’26.45”S/ 70°56’21.31”W, 467m, 01–02.VI.2011, YPT, V. Alarcón & J.F. Costa; 2♀♀, idem but 17.IX–14.XI.2010 333–884m, 12°55’S/ 70°51’W, YPT, M. Vilchez & C. Castillo; 2♀♀ idem but MT. **MADRE DE DIOS:** 2♀♀ Albergue Refugio Amazonas 12°52’30”/69°24’35” 231m, 21.VII.2017 D. Couceiro; 1♀, idem but 27.XI.2017; 1♀, idem but 15.X.2016; 1♀, idem but 04.III.2017; 1♀, idem but 10.VII.2017; 1♂ idem but 20.VII.2017; 1♂, idem but 06.XI.2016; 1♀, idem but 01.XII.2016, MT; 1♂ idem but 02.X.2017, MT; 1♂, idem but 09.VI.2017, LT; 1♀, Tambopata National Reserve, Explorer’s inn, 12°50’30”S/ 69°17’31.1”W, 161m, 19.VII.2009, M. Alvarado; 1♀ similar to previous but 02.VIII.2009; 1♀ 1♂, idem but 16.VIII.2009; 3♂♂, Tambopata National Reserve, Explorer’s Inn, 12°50’44.2”S/ 69°17’34.5”W, 189m, 1–14.XII.2008 MT, M. Alvarado y L. Sulca; 1♀, 3♂♂, idem but 15–28.XII.2008, 1♂ idem but 17–30.XI.2008; 1♂, 12°50’31.6”S/ 69°17’36.1”W, 216m, 20.IV–4.V.2009, MT, L. Sulca y M. Alvarado; 1♂, idem but 25.X.2009; 1♀, idem but 29.VIII.2009; 1♀, CICRA, 4.X.2005, 12°34’S/70°5’W, 208m, C. Castillo & C. Peña; 1♀, idem but MT (MUSM). 1♀, Puerto Maldonado, Sudadero, 12°21’19”S/ 69°1’48”W, 221m, 21–22.VII.2009, M. Alvarado; 1♀, Puerto Maldonado, Madama, 12°31’20”S/ 69°3’44”W, 182m, 19–20.VII.2009, M. Alvarado (SEMC). **LORETO:** 1♂, Iquitos, left bank of Amazonas River, 3°43’7.98”S/ 73°13’33.93”W, 89m, 4.IV.2018 C. Ampudia; 1♂, idem

but 3°43'53.43"S/ 73°13'36.76"W, 92m; 1♀, idem but near to Yurimaguas 5°46'43.82"S/ 76°3'30.78"W, 122m, 11.IV.2018, L. Pérez; 2♀♀, idem but near to Yurimaguas 5°47'22.23"S/ 76°10'11.52"W, 133m, 8.IV.2018, L. Pérez; 1♂, Requena, Bretaña, Lote 95, 5°14'41.54"S/74°19'48.06"W, 105m, 04.VIII.2018, R. Rivera; 1♂, Urituyacu River, near Ayahuasca, 4°20'31"S/ 75°49'3"W, 110m, 25.III.2010, MT, C. Castillo; 1♂, idem but YPT (MUSM). **JUNIN:** 1♂, Satipo, 11°14'14"S/ 74°38'7"W, 953m, 21–25.IV.2012, MT, V. Borda & L. Figueroa (SEMC). **PASCO:** ♀, Oxapampa, Yanachaga-Chemillen National Park, Huampal, 10°10'57"S/ 75°34'25.6"W, 1001m, 30.IV–02.V.2011, J. Grados (MUSM). **PUNO:** 1♂, Sandia, San Pedro de Putina Punco, Bahuaja Sonene National Park, 13°23'29.4"S/ 69°29'00.1"W, 322m, 11–24.IX.2011, E. Guillermo & E. Rázuri (MUSM). **UCAYALI:** 1♂, Coronel Portillo, Calleria, 08°24'54.21"S/ 73°41'36.7"W, 255m, 14.X.2012, B. Medina; 1♂, idem but 08°18'51.81"S/ 73°40'19.52"W, 268m, 27.X.2012, P. Sánchez; 1♂, idem but 73°40'50.78"W/ 08°20'53.67"S, 217m, 23.X.2012 P. Sánchez (MUSM). 1♀, Abujao, 08°21'02"S/ 73°40'50.4"W, 241m, 28.IV.2013, L. Huerto; 1♂, Coronel Portillo, Rio Suaya, 08°56'54.13"S/ 74°0'28.9"W, 230m, 13–14.VII.2008, M. Alvarado (SEMC).

**Description of female holotype.** Fore wing length 7.1 mm.

**Head:** Face (Fig. 1C) granulate-punctate and weakly polished, 0.8× as long as wide; clypeus dorsal half granulate-punctate, ventral half granulate, 2.2× as wide as long; malar space 0.6× as long as basal mandibular width; lateral ocellus separated from compound eye by about 1.2× maximum ocellar diameter; distance between ocelli 1.2× maximum ocellar diameter; scape with truncated section V-shaped, with 44 flagellomeres, ratio of length from second to fourth flagellomeres: 3.2:3.0:2.9, subapical flagellomere 1.1× as long as centrally broad.

**Mesosoma:** Granulate-punctate and weakly polished; notaulus vestigial, weakly impressed anteriorly; subalar prominence low and weakly rounded. Propodeum (Fig. 1D) granulate-punctate; evenly declivous from anterior margin; pleural carina distinct only basally; with a weak, narrow vestige of posterior transverse carina present centrally on an elevation. Fore wing with vein 1m-cu with a ramellus; vein 2m-cu weakly sinuate, with a two bullae, with abscissa and without a stub on spurious vein; 2rs-m 5.2× as long as abscissa of M between 2rs-m and 2m-cu. Hind wing with length of abscissa of Cu1 between Cu1 and 1A 0.2× as long as length of vein Cu1 between M and Cu1.

**Metasoma:** Metasomal tergites (Fig. 1D) granulate, matte; tergite I 2.2× as long as posteriorly wide; tergite II 1.1× as long as posteriorly wide; ovipositor sheath 2.3× as long as metathoracic tibia.

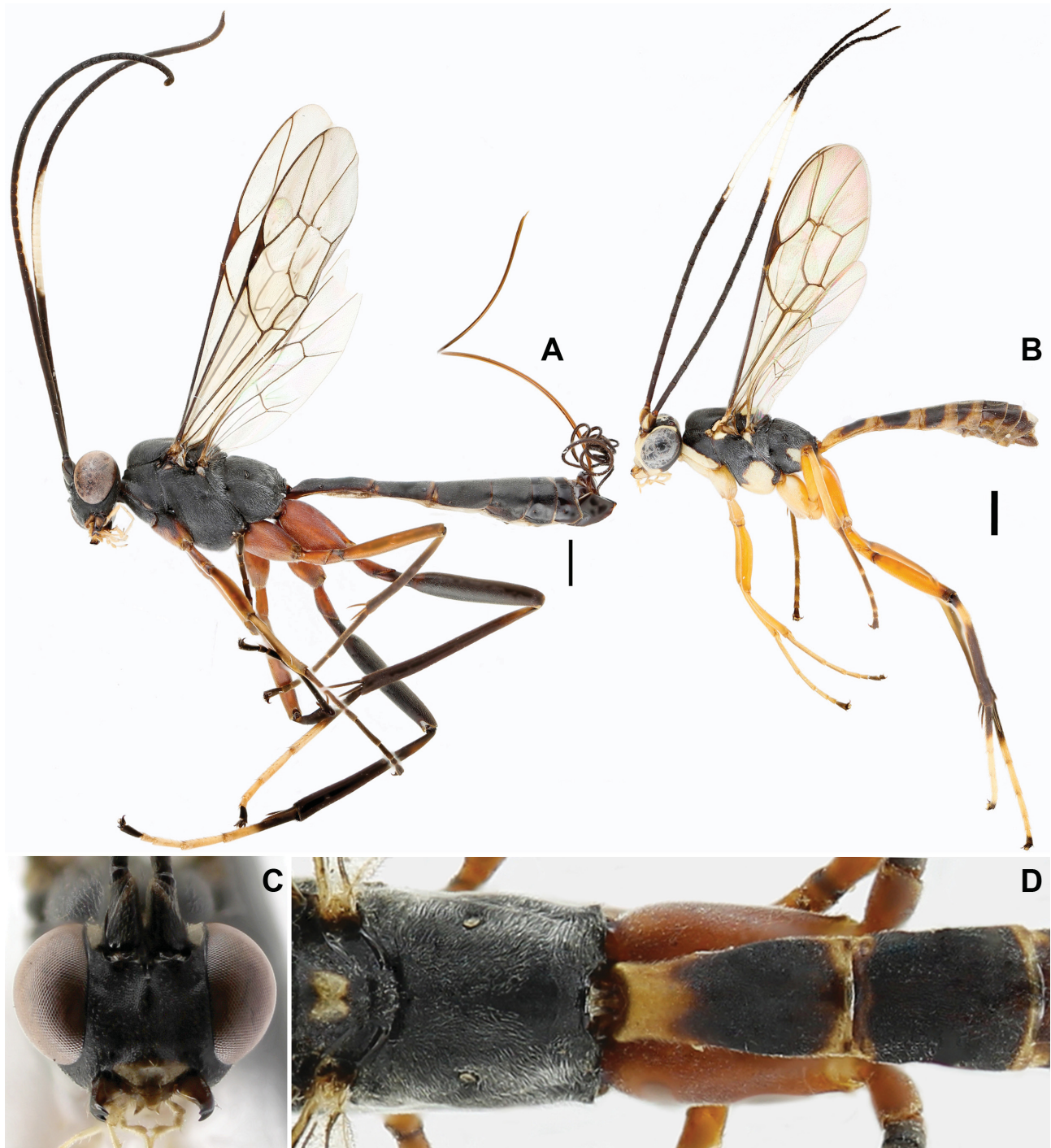
**Colour:** Head (Fig. 1C) black; mandible basally, ventral half of clypeus, palpi, and orbit (between antennal socket and median ocellus) white; antenna black with flagellomeres 7–18 dorsally white. Mesosoma (Fig. 1A) predominantly black; anterior margin of pronotum, subalar prominence, dorsal most section of mesepisternum, and distal half of mesoscutellum off-white (Fig. 1D). Prothoracic leg reddish, tarsus brown. Mesothoracic leg red, tibia and tarsus black. Metathoracic leg predominantly black, coxa and trochanter red, trochantellus and basal end of femur reddish-brown, distal half of tarsomere 1 and tarsomere 2–4 white. Wings hyaline. Metasomal tergites (Fig. 1A) predominantly black; anterior and lateral margins of tergite I reddish, posterior margin of tergites I–II, and anterior margin of tergites II–III off-white; mid-posterior margin of tergites V–VII white. Ovipositor sheath black.

**Variation of female paratypes.** Fore wing length 6.0–8.8 mm. They differ from the holotype in the following features: face 0.7–0.8× as long as wide; malar space 0.6–0.7× as long as basal mandibular width; lateral ocellus separated from compound eye by about 1.1–1.2× maximum ocellar diameter; distance between ocelli 1.0–1.2× maximum ocellar diameter; antenna with 41–45 flagellomeres, ratio of length from second to fourth flagellomeres: 3.0–3.2:2.6–2.9:2.6–2.9, subapical flagellomere 1.0–1.2× as long as centrally broad; fore wing with vein 2m-cu with or without a stub of spurious vein, and 2rs-m 3.1–5.2× as long as abscissa of M between 2rs-m and 2m-cu; hind wing with length of abscissa of Cu1 between Cu1 and 1A 0.1–0.3× as long as length of vein Cu1 between M and Cu1; tergite I 2.1–2.3× as long as posteriorly wide; tergite II 1.2–1.3× as long as posteriorly wide; ovipositor sheath 2.3–2.5× as long as metathoracic tibia. Within the coloration: pronotum ranging from evenly black to having the anterior margin of off-white, mesopleuron rarely with a reddish spot postero-ventrally; prothoracic coxa, in many individuals, basally brownish to brownish-black, rarely leg evenly brownish; some individuals with mesothoracic femur brown; and, metasomal tergite I, in some individuals, anteriorly off-white.

**Male.** Fore wing length 5.2–6.8 mm. The male individuals differ from the females in the following features: clypeus 2.0–2.1× as wide as long; malar space 0.7–0.8× as long as basal mandibular width; lateral ocellus separated from compound eye by about 1.0–1.1× maximum ocellar diameter; distance between ocelli 1.0–1.3× maximum ocellar diameter; antenna with 39–44 flagellomeres, ratio of length from second to fourth flagellomeres: 3.3–3.4:3.2–3.3:3.2–3.3, subapical flagellomere 2.2–2.5× as long as centrally broad; pleural carina distinct along



its length; fore wing with vein 1m-cu with a ramellus (rarely without a ramellus), vein 2m-cu with one long bulla (rarely with two bullae), without a stub on spurious vein, 2rs-m 2.5–3.3× as long as abscissa of M between 2rs-m and 2m-cu; tergite I 2.2–2.6× as long as posteriorly wide; tergite II 1.1–1.2× as long as posteriorly wide, rarely 0.9× as long as posteriorly wide;



**FIGURE 1.** Details of *Mnioes attenboroughi* sp. nov. (paratype) **A.** Lateral habitus of female (scale bar = 1 mm), **B.** Lateral habitus of male (scale bar = 1 mm) **C.** Facial view of female **D.** Propodeum and first two metasomal tergites of female.

*Male (colour):* Head (Fig. 1B) predominantly white with frons centrally, vertex, gena, and occiput black; antenna predominantly black with scape and pedicel ventrally white, flagellomeres black with flagellomeres 14 or 15–16 (rarely 19) entirely and dorsally of flagellomeres 13–14 and 17–18 (rarely 20–21) white. Mesosoma (Fig. 1B) predominantly black with anterior margin and postero-dorsal corner of pronotum, prosternum, mesosternum, subalar prominence, tegula, humeral plate, mesoscutellum, lower half of mesopleuron, dorsal most section of mese-

pisternum, and a spot dorso-posteriorly of metapleuron white. Prothoracic leg orange, coxa and trochanter white, tarsus light brown. Mesothoracic leg orange, coxa anteriorly white, tarsus brown. Metathoracic leg orange, coxa basal-dorsally white, tibia brown, tarsomeres 1–4 white, and tarsomere 5 black. Wings hyaline. Metasomal tergites predominantly black; anterior and posterior margins of tergites I–III white or off-white; posterior margin of tergite IV white or off-white; tergite I laterally, in some individuals, off-white (rarely also of tergites II–III); posterior margin of tergites IV–VI off-white or black; mid-posterior margin of tergite VII white.

**Comments.** The specimens from the Albergue Refugio Amazonas were collected by guests at the Refugio Amazonas Lodge, located on the right bank of the Tambopata River (Madre de Dios, Peru), as part of a Citizen Science program, with the mutual collaboration between the MUSM and Rainforest Expeditions. The collections done in the Refugio Amazonas lodge used light, Malaise, and pan traps (daily serviced) from March 2016 to August 2017, and the collections at the Explorer's Inn were carried out from December 2008 to November 2009 using solely Malaise traps; these collections showed that the species flies throughout the year, except January and February.

**Distribution.** This species is widely distributed in the Amazon basin (Fig. 9A), from sea level to 600m, rarely, between 1000–1200m.

**Etymology.** The specific epithet *attenboroughi* honours Sir David Frederick Attenborough; the members of the project “Discovery new species” want to commemorate him for raising awareness about the importance of wildlife conservation and his educational documentaries on wildlife that inspired many biologists, among them the author.

### *Mnioes huk* sp. nov.

(Figs 2, 9A)

**Diagnosis.** *Mnioes huk* sp. nov. can be distinguished from its female congeners by the following combination of traits: facial orbit light yellow, flagellomeres 8–15 entirely light yellow, mesoscutum and tegula black, wings evenly infusate, and ovipositor sheath 2.8× as long as metatibia.

**Material examined:** *Holotype:* ♀ “PERÚ: PA. Villa Rica, Z.A. del Bosque San Matías San Carlos 75°12'37"W/10°38'44"S 1596m 06-10.viii.2012 FIT P. Sánchez & E. Rázuri”. *Paratype:* 1♀, similar to holotype (MUSM).

**Description of female holotype.** Fore wing length 8.8 mm.

**Head:** Face (Figs 2B–C) granulate-punctate and weakly polished, 0.8× as long as wide; clypeus granulate with scattered punctures, 2.0× as wide as long; malar space 0.7× as long as basal mandibular width; lateral ocellus separated from compound eye by about 1.1× maximum ocellar diameter; distance between ocelli 0.9× maximum ocellar diameter; scape with truncated section V-shaped, with 48 flagellomeres, ratio of length from second to fourth flagellomeres: 3.2:2.8:2.7, subapical flagellomere 1.0× as long as centrally broad.

**Mesosoma:** Granulate-punctate and weakly polished; notaulus vestigial, weakly impressed anteriorly; subalar prominence low and weakly rounded. Propodeum (Fig. 2D) granulate-punctate; declivous from anterior margin, centrally between anterior margin and posterior transverse carinae with a median longitudinal concavity, weakly folded in homologous position to lateral longitudinal carina; pleural carina present; posterior transverse carina present, except laterally. Fore wing with vein 1m-cu with a ramellus; vein 2m-cu weakly sinuate, with a two bullae, with abscissa and with a stub on spurious vein; 2rs-m 3.5× as long as abscissa of M between 2rs-m and 2m-cu. Hind wing with length of abscissa of Cu1 between Cu1 and 1A 0.2× as long as length of vein Cu1 between M and Cu1.

**Metasoma:** Metasomal tergites granulate, matte; tergite I 2.8× as long as posteriorly wide; tergite II 1.2× as long as posteriorly wide; ovipositor sheath 2.8× as long as metathoracic tibia (Fig. 2A).

**Colour:** Head (Figs 2B–C) black, face (with a median vertical brown mark), clypeus, mandibles, and orbit (reaching to median ocellus) light yellow, palpi off-white; antenna black with scape ventrally orange, apical third of flagellomere 7 and flagellomeres 8–15 entirely light yellow. Mesosoma predominantly black with anterior margin of pronotum yellowish. Prothoracic and mesothoracic legs orange, tarsomeres 2–5 brown. Metathoracic leg with coxa, trochanter, trochantellus, and basal end of femur orange; femur, tibia, basal quarter of length of basitarsus, and tarsomere 5 black; distal 3/4 of the length of basitarsus and tarsomeres 2–4 white. Wings evenly infusate. Metasomal tergites predominantly orange, tergite I centrally and tergites II–IV with maculae brownish. Ovipositor sheath dark brown.

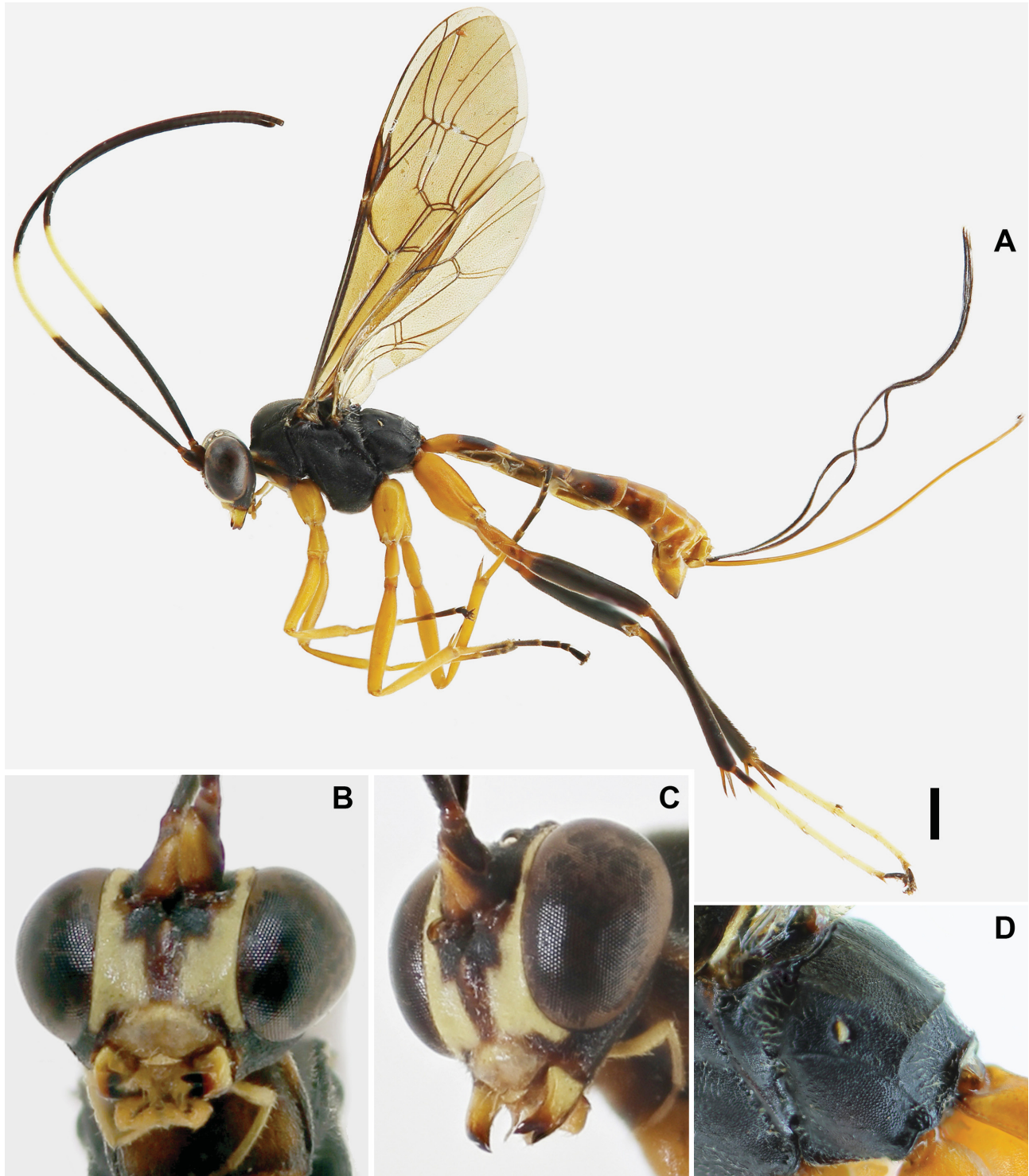
**Variation of female paratype.** Fore wing length 10.7 mm. It differs from the holotype in the following features: ratio of length from second to fourth flagellomeres: 3.3:2.9:2.8; fore wing with vein 2m-cu without a stub on spurious vein, 2rs-m 4.0× as long as abscissa of M between 2rs-m and 2m-cu; tergite I 2.6× as long as posteriorly wide;

tergite II 1.3× as long as posteriorly wide; and ovipositor sheath 2.9× as long as metathoracic tibia. Within the coloration: face predominantly brown with facial orbit light yellow, mesosoma evenly black; prothoracic and mesothoracic coxae and mesothoracic femur brownish; metathoracic coxa, trochanter, trochantellus, and femur black; metasomal tergites predominantly orange, tergite I brown with posterior margin orange.

*Male.* Unknown.

**Distribution.** This species was collected in a primary cloud forest, in the buffer zone of San Matías–San Carlos Protection Forest, Pasco (Fig. 9A).

**Etymology.** The specific epithet *huk* means “one” in Quechua. It is treated as a masculine noun in apposition.



**FIGURE 2.** Details of *Mnioes huk* sp. nov. (holotype). **A.** Lateral habitus of female (scale bar = 1 mm) **B.** Frontal view of head **C.** Latero-frontal view of head **D.** Ventro-dorsal view of propodeum.



***Mnioes iskay* sp. nov.**

(Figs 3, 9A)

**Diagnosis.** *Mnioes iskay* sp. nov. is the only species within the genus that has the frons evenly black, metasomal tergites shiny, and female with antenna evenly black.

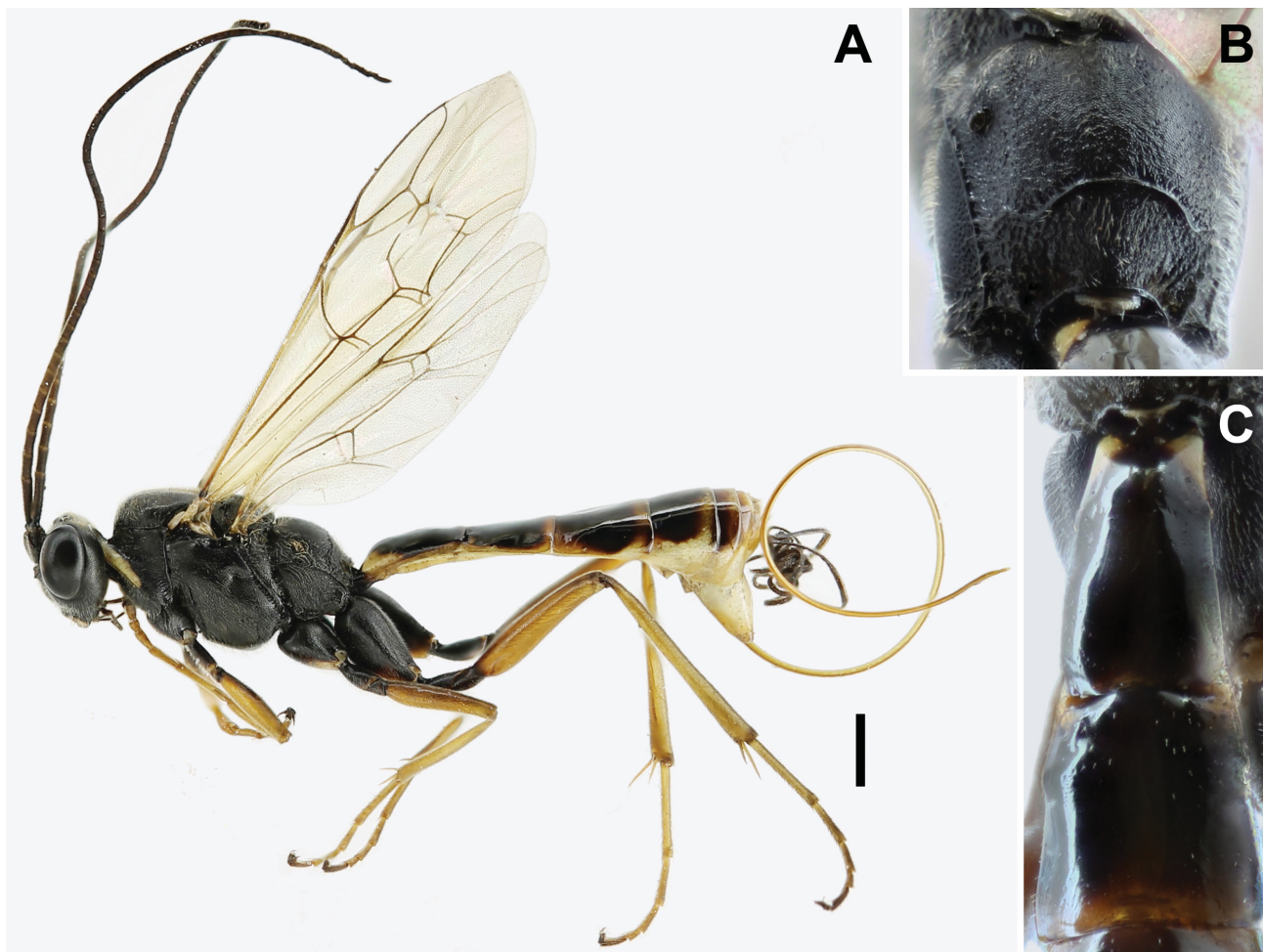
**Material examined:** *Holotype:* ♀, “PERÚ: CA. Sorochuco, El Galeno 78°20’14”W/ 6°58’28”S 13-15/iv/2009 3975m L. Huerto” (MUSM).

**Description of female holotype.** Fore wing length 7.1 mm.

**Head:** Face granulate-punctate and weakly polished,  $0.6\times$  as long as wide; clypeus dorsal half granulate-punctate, ventral half granulate,  $1.5\times$  as wide as long; malar space  $1.1\times$  as long as basal mandibular width; lateral ocellus separated from compound eye by about  $1.5\times$  maximum ocellar diameter; distance between ocelli  $1.5\times$  maximum ocellar diameter; scape with truncated section V-shaped; with 52 flagellomeres, ratio of length from second to fourth flagellomeres: 2.9:2.8:2.6, subapical flagellomere  $1.2\times$  as long as centrally broad.

**Mesosoma:** Granulate-punctate and weakly polished; notaulus vestigial, weakly impressed anteriorly; subalar prominence low and elongate. Propodeum (Fig. 3B) granulate-punctate; evenly declivous from anterior margin; pleural carina present; posterior transverse carina present, complete and strong, up-curved. Fore wing with vein 1m-cu with a ramellus; vein 2m-cu weakly sinuate, with a two bullae, with abscissa and with a stub on spurious vein; 2rs-m  $2.8\times$  as long as abscissa of M between 2rs-m and 2m-cu. Hind wing with length of abscissa of Cu1 between Cu1 and 1A  $0.3\times$  as long as length of vein Cu1 between M and Cu1.

**Metasoma:** Metasomal tergites softly granulate, shiny; tergite I  $1.9\times$  as long as posteriorly wide; tergite II  $1.0\times$  as long as posteriorly wide; ovipositor sheath  $4.0\times$  as long as metathoracic tibia.



**FIGURE 3.** Details of *Mnioes iskay* sp. nov. (holotype). **A.** Lateral habitus of female (scale bar = 1 mm) **B.** Dorsal view of propodeum **C.** Dorsal view of metasomal tergites I–II.



**Colour:** Head black, ventral half of clypeus and mandibles at middle white. Mesosoma predominantly black; anterior margin of pronotum, tegula, and humeral plate white. Legs with coxae (but ventrodistally off-white), trochanter (but ventrodistally off-white), and trochantellus black but distally off-white; femurs, tibiae and tarsomeres orange-brown. Wings hyaline. Metasomal tergites predominantly black, latero-anteriorly of tergite I, lateral margin of tergites II–VII, posterior margin of tergites V–VII, and hypopygium off-white; posterior margins of tergites II–IV reddish. Ovipositor sheath black.

**Male.** Unknown.

**Comments.** Within the genus, it is the species that occurs at the highest elevation, 3975m.

**Distribution.** Cajamarca (Fig. 9A).

**Etymology.** The specific epithet *iskay* means “two” in Quechua. It is treated as a masculine noun in apposition.

### ***Mnioes kinsa* sp. nov.**

(Figs 4C, 9B)

**Diagnosis.** *Mnioes kinsa* sp. nov. can be distinguished from its female congeners by the following combination of traits: frontal and facial orbit white, tegula light yellow, mesoscutum with a light yellow spot at center, metasoma red, flagellomeres 7–20 entirely white, ovipositor sheath  $2.1\times$  as long as metathoracic tibia. It resembles to *M. nalles* Ugalde-Gómez and Gauld, 2002 as both have females with gena black, mesoscutum black with a small central white mark, metasoma predominantly reddish, and propodeum black with posterolateral white marks; they differ in the length of the ovipositor sheaths  $2.1\times$  as long as metathoracic tibia in *M. kinsa* sp. nov. (vs.  $2.9\text{--}3.1\times$ ) and meso- and metathoracic tibia off-yellow (vs. basally reddish and distally infusate).

**Material examined:** *Holotype:* ♀, “PERÚ: PA. Oxapampa, PN Yanachaga-Chemillén, Puesto Huampal  $10^{\circ}10'57''\text{S}/75^{\circ}34'25.6''\text{W}$  1001m 30.iv–02.v.2010 C. Carranza Leg” (MUSM). Left leg removed for molecular work [DNA-Ichn 00020], and right tarsus missing.

**Description of female holotype.** Fore wing length 8.6 mm.

**Head:** Face granulate-punctate and weakly polished,  $0.7\times$  as long as wide; clypeus dorsal half granulate, ventral half granulate-punctate,  $1.9\times$  as wide as long; malar space  $0.6\times$  as long as basal mandibular width; lateral ocellus separated from compound eye by about  $1.2\times$  maximum ocellar diameter; distance between ocelli  $1.1\times$  maximum ocellar diameter; scape with truncated sections V-shaped; with 45 flagellomeres, ratio of length from second to fourth flagellomeres:  $2.9:2.6:2.6$ , subapical flagellomere  $1.8\times$  as long as centrally broad.

**Mesosoma:** Granulate-punctate and weakly polished; notaulus vestigial, weakly impressed anteriorly; subalar prominence low and weakly rounded. Propodeum granulate-punctate; evenly declivous from anterior margin, weakly folded in homologous position to lateral longitudinal carina next to spiracle; pleural carina present; with a weak vestige of posterior transverse carina present, except laterally. Fore wing with vein 1m-cu without a ramellus; vein 2m-cu weakly sinuate, with a two bullae, with abscissa and without a stub on spurious vein; 2rs-m  $3.1\times$  as long as abscissa of M between 2rs-m and 2m-cu. Hind wing with length of abscissa of Cu1 between Cu1 and 1A  $0.3\times$  as long as length of vein Cu1 between M and Cu1.

**Metasoma:** Metasomal tergites granulate, matte; tergite I  $2.3\times$  as long as posteriorly wide; tergite II  $1.1\times$  as long as posteriorly wide; ovipositor sheath  $2.1\times$  as long as metathoracic tibia.

**Colour:** Head predominantly light yellow, but face with a median vertical mark, upper half of clypeus, frons centrally, vertex, and gena black; antenna predominantly black, scape ventrally light yellow, and flagellomere 6 ventrally and flagellomeres 7–20 entirely white. Mesosoma predominantly black, but light yellow on anterior margin and postero-dorsal corner of pronotum, mesoscutellum, postscutellum, a spot at center of mesoscutum, a spot postero-ventrally of mesopleuron, subalar prominence, tegula, humeral plate, dorsal most section of mesepisternum, dorso-centrally of metapleuron, propodeum laterally (between spiracle and posterior transverse carina) and mid-section of posterior transverse carina. Legs reddish with prothoracic coxa lateroventrally (dorsally brownish) and mesothoracic coxa lateroventrally (basally) light yellow, mesothoracic tarsus brown, meso- and metathoracic tibia off-yellow. Wings hyaline. Metasomal tergites predominantly reddish, anterior third of length of tergite I and posterior margin of tergite II yellowish, posterior margin of tergite I off-white. Ovipositor sheath black.

**Male.** Unknown.

**Distribution.** This species was collected in a cloud forest in Yanachaga–Chemillén National Park, Pasco (Fig. 9B).

**Etymology.** The specific epithet *kinsa* means “three” in Quechua. It is treated as a masculine noun in apposition.



**FIGURE 4.** Details of *Mnioes poncei* sp. nov. and *Mnioes kinsa* sp. nov. **A–B** *Mnioes poncei* sp. nov. (holotype) **A.** Lateral habitus of female (scale bar = 1 mm) **B.** Lateral view of head **C.** *Mnioes kinsa* sp. nov. (holotype), lateral habitus of female (scale bar = 1 mm).

***Mnioes pisqa* sp. nov.**

(Figs 5A–B, 9B)

**Diagnosis.** *Mnioes pisqa* sp. nov. can be distinguished from its female congeners by the following combination of traits: frontal orbit yellowish, flagellomeres 5–22 entirely yellow, ovipositor sheath 2.5× as long as metathoracic tibia.

**Material examined.** *Holotype*: ♀, “PERU: CU, La Convención, Echarate, CC. Otsanampiato 12°39′39.55″S/ 73°09′24.92″W 1654m. 15.ix.2010. Light, M. Alvarado y J. Peralta”. *Paratype*. 1♀, same data as holotype (MUSM).

**Description of female holotype.** Fore wing length 7.6 mm.

**Head:** Face granulate-punctate and weakly polished, 0.7× as long as wide; clypeus granulate-punctate, 1.9× as wide as long; malar space 0.9× as long as basal mandibular width; lateral ocellus separated from compound eye by about 1.1× maximum ocellar diameter; distance between ocelli 1.0× maximum ocellar diameter; scape with truncated section V-shaped (Fig. 5B), with 45 flagellomeres, ratio of length from second to fourth flagellomeres: 2.7:2.5:2.5, subapical flagellomere 0.9× as long as centrally broad.

**Mesosoma:** Granulate-punctate and weakly polished; notaulus vestigial, weakly impressed anteriorly; subalar prominence low and weakly rounded. Propodeum granulate-punctate; declivous from anterior margin, centrally between anterior margin and posterior transverse carinae with a median longitudinal concavity, weakly folded in homologous position to lateral longitudinal carina only next to spiracle; pleural carina present; posterior transverse carina present. Fore wing with vein 1m-cu with a ramellus; vein 2m-cu weakly sinuate, with a two bullae, with abscissa and with a stub on spurious vein; 2rs-m 3.1× as long as abscissa of M between 2rs-m and 2m-cu. Hind wing with length of abscissa of Cu1 between Cu1 and 1A 0.4× as long as length of vein Cu1 between M and Cu1.

**Metasoma:** Metasomal tergites granulate, matte; tergite I 2.0× as long as posteriorly wide; tergite II 1.3× as long as posteriorly wide; ovipositor sheath 2.5× as long as metathoracic tibia.

**Colour:** Head black, ventral half of clypeus off-white, palpi orange, orbit (between antennal socket and median ocellus) yellow; antenna black with apical half of flagellomere 3, basal half of flagellomere 4, and flagellomere 2–3 brown, apical half of flagellomere 4, 5–22 (entirely) yellow. Mesosoma (Fig. 5A) black, subalar prominence brownish black. Legs orange, prothoracic leg with coxa basally brownish, tarsomere 3–5 of prothoracic and mesothoracic leg light brown. Wings softly infusate. Metasomal tergites orange; tergite I centrally brownish; ovipositor sheath dark brown.

**Variation of female paratype.** Fore wing length 8.0 mm. It differs from the holotype in the following features: clypeus 1.8× as wide as long; lateral ocellus separated from compound eye by about 1.0× maximum ocellar diameter; ratio of length from second to fourth flagellomeres: 2.7:2.3:2.3; fore wing with vein 1m-cu without a ramellus, vein 2m-cu without a stub on spurious vein, 2rs-m 3.0× as long as abscissa of M between 2rs-m and 2m-cu; tergite I 2.1× as long as posteriorly wide.

**Male.** Unknown.

**Distribution.** The species was collected in Cuzco department (Fig. 9B), using light traps.

**Etymology.** The specific epithet *pisqa* means “five” in Quechua. It is treated as a masculine noun in apposition.

### ***Mnioes poncei* sp. nov.**

(Figs 4, 9B)

**Diagnosis.** *Mnioes poncei* sp. nov. can be distinguished from its female congeners by the following combination of traits: frontal and facial orbit white, tegula black, mesoscutum with longitudinal notaular stripes extending from anterior margin to center and a spot at center white, and metasoma red. This species has the shortest ovipositor sheath length in the genus, 1.6× as long as metathoracic tibia.

**Material examined.** *Holotype:* ♀, “PERU, MD, Albergue Refugio Amazonas 12°52’30”/69°24’35” 231 m 26.iv.2017 D. Couceiro // WIRED AMAZON PROYECT PAN TRAP” (MUSM). Right leg removed for molecular work [DNA-Ichn00391].

**Description of female holotype.** Fore wing length 6.0 mm.

**Head:** Face granulate-punctate and weakly polished, 0.7× as long as wide; clypeus granulate, 2.0× as wide as long; malar space 1.0× as long as basal mandibular width; lateral ocellus separated from compound eye by about 1.0× maximum ocellar diameter; distance between ocelli 1.3× maximum ocellar diameter; scape (Fig. 4B) with truncated section U-shaped, with 44 flagellomeres, ratio of length from second to fourth flagellomeres: 3.9:3.6:3.1, subapical flagellomere 1.0× as long as centrally broad.

**Mesosoma:** Granulate-punctate and weakly polished; notaulus undistinguishable; subalar prominence low and weakly rounded. Propodeum granulate-punctate; evenly declivous from anterior margin; pleural carina present; with a weak vestige of posterior transverse carina present, except laterally. Fore wing with vein 1m-cu without a ramellus; vein 2m-cu straight, with a single bulla, without abscissa and without a stub of spurious vein; 2rs-m 1.5× as long as abscissa of M between 2rs-m and 2m-cu. Hind wing with length of abscissa of Cu1 between Cu1 and 1A 0.7× as long as length of vein Cu1 between M and Cu1.

**Metasoma:** Metasomal tergites granulate, matte; tergite I 1.8× as long as posteriorly wide; tergite II 0.9× as long as posteriorly wide; ovipositor sheath 1.6× as long as metathoracic tibia (Fig. 4A).

**Colour:** Head (Fig. 4B) predominantly black; clypeus off-white, mandibles, palpi, and orbit (between upper half of face and after lateral ocellus) white; antenna black with flagellomeres 9–15 (entirely) and dorsal half of flagellomere 16 white. Mesosoma (Fig. 4B) predominantly black; anterior margin of pronotum (dorsally), subalar prominence, humeral plate, mesoscutum with longitudinal notaular stripes extending from anterior margin to center and a spot at center, mesoscutellum, postscutellum, a spot postero-ventrally of mesopleuron, upper division of metapleuron, and a band covering dorso-posterior section of metapleuron and dorso-posterior section of propodeum white. Prothoracic leg orange, coxa and trochanter white, tarsomeres 3–5 light brown. Mesothoracic leg orange, coxa basal-laterally white, tarsomeres 3–5 light brown. Metathoracic leg reddish-orange, tibia brown, tarsomeres 1–4 white, and tarsomere 5 black. Wings hyaline. Metasoma reddish; ovipositor sheath black, distal end white (Fig. 4A).



*Male.* Unknown.

**Comments.** Despite the effort done in the Refugio Amazonas Lodge representing almost two years of continuous sampling, and the variety of traps employed (pan trap, Malaise traps, and light traps), only one individual was collected. It overlaps its distribution with the widely distributed species *M. attenboroughi* **sp. nov.**, of which several individuals were collected.

**Distribution.** Madre de Dios (Fig. 9B).

**Etymology.** The specific epithet *pncei* honours Carlos Ponce del Prado. Members of the project Discovery want to commemorate him for his educational labour and laudable work as promoter of protected natural areas in Peru.

***Mnioes pusaq* sp. nov.**

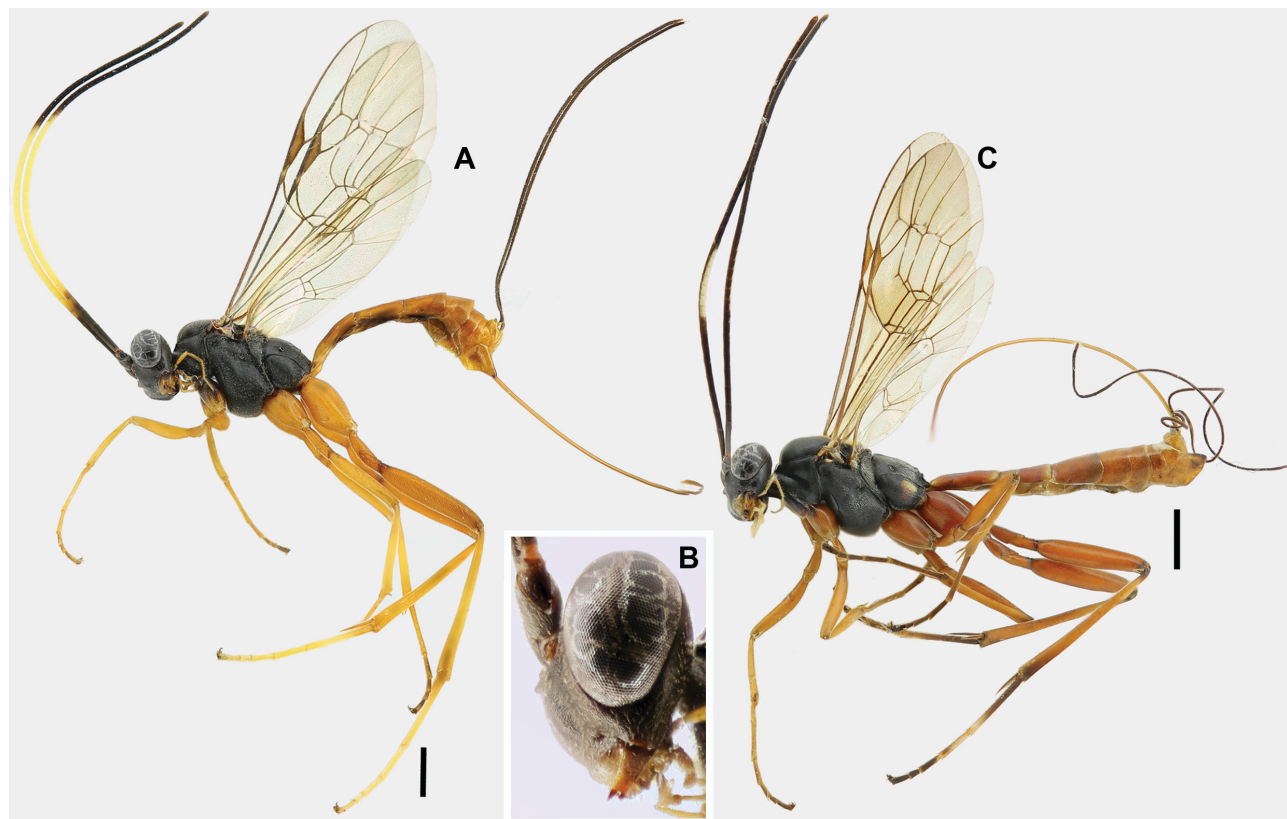
(Figs 5C, 9B)

**Diagnosis.** *Mnioes pusaq* **sp. nov.** can be distinguished from its female congeners by the following combination of traits: face black, flagellomeres 8–14 dorsally white, mesoscutum black, tegula brownish, metasoma predominantly red, wings softly infusate but centrally hyaline, and ovipositor sheath  $2.2\times$  as long as metathoracic tibia,

**Material examined.** *Holotype*: ♀, “PERU: CA. Monteseco, ~1232m.  $6^{\circ}51'34.5''\text{S}/79^{\circ}6'41.5''\text{W}$ . 17.v.2010 J. Grados leg.” (MUSM).

**Description of female holotype.** Fore wing length 7.1 mm.

*Head*: Face granulate-punctate and weakly polished,  $0.7\times$  as long as wide; clypeus dorsal half granulate-punctate, ventral half granulate,  $2.1\times$  as wide as long; malar space  $0.8\times$  as long as basal mandibular width; lateral ocellus separated from compound eye by about  $1.1\times$  maximum ocellar diameter; distance between ocelli  $1.1\times$  maximum ocellar diameter; scape with truncated section V-shaped, with 41 flagellomeres, ratio of length from second to fourth flagellomeres:  $3.1:2.8:2.6$ , subapical flagellomere  $1.2\times$  as long as centrally broad.



**FIGURE 5.** Details of *Mnioes pisqa* **sp. nov.** and *M. pusaq* **sp. nov.** A–B *Mnioes pisqa* **sp. nov.** (holotype) A. Lateral habitus of female (scale bar = 1 mm) B. Lateral view of head C. *Mnioes pusaq* **sp. nov.** (holotype), lateral habitus of female (scale bar = 1 mm).

**Mesosoma:** Granulate-punctate and weakly polished; notaulus vestigial, weakly impressed anteriorly; subalar prominence low and weakly rounded. Propodeum granulate-punctate; evenly declivous from anterior margin; pleural carina present; with a weak vestige of posterior transverse carina centrally. Fore wing with vein 1m-cu with a ramellus; vein 2m-cu weakly sinuate, with a two bullae, with abscissa and with a stub on spurious vein; 2rs-m 3.2× as long as abscissa of M between 2rs-m and 2m-cu. Hind wing with length of abscissa of Cu1 between Cu1 and 1A 0.1× as long as length of vein Cu1 between M and Cu1.

**Metasoma:** Metasomal tergites granulate, matte; tergite I 2.3× as long as posteriorly wide; tergite II 1.2× as long as posteriorly wide; ovipositor sheath 2.2× as long as metathoracic tibia.

**Colour:** Head predominantly black; lower half of clypeus, middle of mandibles, palpi and frontal orbit (between antennal socket and after median ocellus) off-white; antenna predominantly black, scape ventrally brownish, flagellomeres 8–14 dorsally white. Mesosoma (Fig. 5C) predominantly black, but light yellow on anterior margin (dorsally) of pronotum, mesoscutellum, subalar prominence, dorsal most section of mesepisternum, and dorso-centrally of metapleuron (surrounded by a reddish-brown coloration), and brownish on tegula, humeral plate, and postscutellum. Legs predominantly reddish, prothoracic and mesothoracic tarsomeres light brown; mesothoracic tibia apically and tarsus brown but apical half of tarsomere 1 and tarsomere 2 off-white. Wings softly infusate, centrally hyaline. Metasomal tergites (Fig. 5C) predominantly red, posterior margin of tergites I–II yellowish. Ovipositor sheath black.

**Male.** Unknown.

**Distribution.** Cajamarca (Fig. 9B), from the Andes western slopes.

**Etymology.** The specific epithet *pusaq* means “eight” in Quechua. It is treated as a masculine noun in apposition.

### ***Mnioes qanchis* sp. nov.**

(Figs 6, 9C)

**Diagnosis.** *Mnioes qanchis* sp. nov. can be distinguished from its female congeners by the following combination of traits: face evenly black, flagellomeres 8–20 entirely light yellow, tegula black, mesoscutum black, wings softly infusate, and ovipositor sheath 2.5× as long as metathoracic tibia.

**Material examined.** *Holotype:* ♀, “PERÚ: MD. Reserva Comunal Amarakaeri 71°07'15.4"W/ 12°53'11.5"S, 1044m 09.ix.2010 Malaise M. Vilchez” (MUSM).

**Description of female holotype.** Fore wing length 8.3 mm.

**Head:** Face granulate-punctate and weakly polished, 0.7× as long as wide; clypeus dorsal half granulate-punctate, ventral half granulate and with scattered punctures, 1.8× as wide as long; malar space 0.8× as long as basal mandibular width; lateral ocellus separated from compound eye by about 1.1× maximum ocellar diameter; distance between ocelli 1.1× maximum ocellar diameter; scape with truncated section V-shaped, with 44 flagellomeres, ratio of length from second to fourth flagellomeres: 3.0:2.8:2.7, subapical flagellomere 1.1× as long as centrally broad.

**Mesosoma:** Granulate-punctate and weakly polished; notaulus vestigial, weakly impressed anteriorly; subalar prominence low and rounded. Propodeum granulate-punctate; declivous from anterior margin, centrally between anterior margin and posterior transverse carinae with a median longitudinal concavity, weakly folded in homologous position to lateral longitudinal carina only next to spiracle; pleural carina present; posterior transverse carina present. Fore wing with vein 1m-cu with a ramellus; vein 2m-cu weakly sinuate, with two bullae, with abscissa and with a stub on spurious vein; 2rs-m 2.6× as long as abscissa of M between 2rs-m and 2m-cu. Hind wing with length of abscissa of Cu1 between Cu1 and 1A 0.3× as long as length of vein Cu1 between M and Cu1.

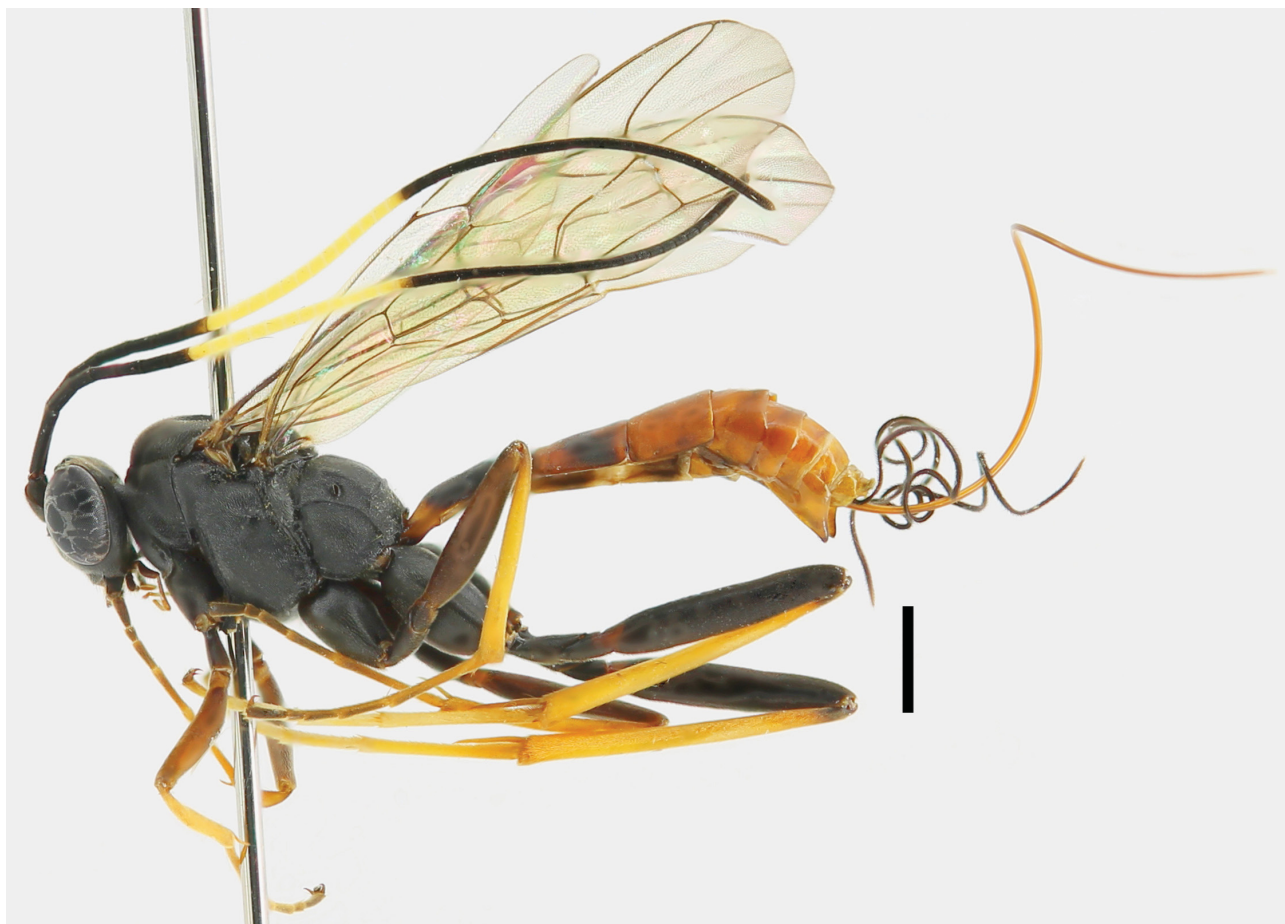
**Metasoma:** Metasomal tergites granulate, matte; tergite I 1.9× as long as posteriorly wide; tergite II 1.1× as long as posteriorly wide; ovipositor sheath 2.5× as long as metathoracic tibia.

**Colour:** Head black, mandible distally and palpi dark brown, ventral half of clypeus and orbit (between middle of frons and median ocellus) off-white; antenna black with flagellomeres 8–20 entirely light yellow. Mesosoma black. Prothoracic leg with coxa and trochanter black, trochantellus and femur reddish-brown, tibia and basitarsus yellow, tarsomeres 2–4 light brown. Mesothoracic leg with coxa, trochanter, and trochantellus black; femur brown; tibia and tarsus ventrally yellow; tarsus dorsally light brown. Metathoracic leg with coxa, trochanter, trochantellus, and femur black; tibia and tarsus yellow. Wings softly infusate. Metasomal tergites predominantly reddish brown, tergite I black with anterior margin reddish brown, tergite II with two dark brown spots medially. Ovipositor sheath black, distal end brownish.

*Male.* Unknown.

**Distribution.** Madre de Dios (Fig. 9C).

**Etymology.** The specific epithet *qanchis* means “seven” in Quechua. It is treated as a masculine noun in apposition.



**FIGURE 6.** Details of *Mnioes qanchis* **sp. nov.** (holotype). Habitus in lateral view (scale bar = 1 mm).

***Mnioes soqta* sp. nov.**

(Figures 7, 9C)

**Diagnosis.** *Mnioes soqta* **sp. nov.** can be distinguished from its female congeners by the following combination of traits: face, mesoscutum, tegula, and coxae predominantly black; ovipositor sheath  $\sim 2.5\times$  as long as metatibia; wings softly infusate, with apical and preapical blackish bands. While, males can be distinguished by the mesoscutum entirely black and wings softly infusate, with apical and preapical blackish bands.

**Material examined.** *Holotype:* ♀, “PERÚ: CU. San Pedro 13°02’58”S/ 71°32’13”W 1500m 20.ix.2007 Malaise C. Castillo”. *Paratypes.* CUZCO: 3♀, 1♂, “PERÚ: CU, Cosñipata valley, San Pedro, 13°03’23”S/ 71°32’55”W, 22.ix.2007, 1520m, MT, C. Castillo; ♀, 2♂♂, idem but 13°03’22.5”S/ 71°32’55.2”W, XII.2007. PASCO: 1♀, Villa Rica, Bosque San Matias San Carlos Protected Area, 10°38’51”S/ 75°12’22”W, 1556m, 03-05.v.2012, LT, L. Figueroa & V. Borda (MUSM).

**Description of female holotype.** Fore wing length 7.2 mm.

**Head:** Face granulate-punctate and weakly polished,  $0.7\times$  as long as wide; clypeus granulate with scarce punctures,  $2.1\times$  as wide as long; malar space  $0.8\times$  as long as basal mandibular width; lateral ocellus separated from compound eye by about  $1.1\times$  maximum ocellar diameter; distance between ocelli  $0.8\times$  maximum ocellar diameter; scape with truncated section V-shaped; with 43 flagellomeres, ratio of length from second to fourth flagellomeres: 3.3:2.8:2.8, subapical flagellomere  $0.9\times$  as long as centrally broad.

**Mesosoma:** Granulate-punctate and weakly polished; notaulus vestigial, weakly impressed anteriorly; subalar



prominence low and weakly rounded. Propodeum granulate-punctate; declivous from anterior margin, centrally between anterior margin and posterior transverse carinae with a median longitudinal concavity, weakly folded in homologous position to lateral longitudinal carina only next to spiracle; pleural carina present; posterior transverse carina present, except laterally. Fore wing with vein 1m-cu without a ramellus; vein 2m-cu weakly sinuate, with a single bulla, without abscissa and without a stub of spurious vein; 2rs-m  $2.3\times$  as long as abscissa of M between 2rs-m and 2m-cu. Hind wing with length of abscissa of Cu1 between Cu1 and 1A  $0.2\times$  as long as length of vein Cu1 between M and Cu1.

*Metasoma*: Metasomal tergites granulate, matte; tergite I  $2.1\times$  as long as posteriorly wide; tergite II  $1.2\times$  as long as posteriorly wide; ovipositor sheath  $\sim 2.5\times$  as long as metathoracic tibia.

*Colour*: Head (Fig. 7A) black, ventral half of clypeus and orbit (between antennal socket and median ocellus) off-white; antenna black 8–13 (entirely) and ventral half of flagellomeres 14–15 white. Mesosoma (Fig. 7A) black. Prothoracic leg black, coxa distally off-white. Mesothoracic leg black, coxa distally, distal half of tarsomere 2 and basal half of tarsomere 3 off-white. Metathoracic leg predominantly black; distal end of coxa, distal half of tarsomere 2, and basal half of tarsomere 3 off-white. Wings (Fig. 7A) softly infusate, with apical and preapical bands blackish. Metasomal tergites and ovipositor sheath black.

*Variation of female paratypes*. Fore wing length 6.0–7.5 mm. They differ from the holotype in the following features: clypeus  $1.9\text{--}2.2\times$  as wide as long; malar space  $0.7\text{--}0.8\times$  as long as basal mandibular width; lateral ocellus separated from compound eye by about  $0.9\text{--}1.3\times$  maximum ocellar diameter; antenna with 43–45 flagellomeres, ratio of length from second to fourth flagellomeres:  $3.2\text{--}3.5:2.8\text{--}3.1:2.8\text{--}3.1$ , subapical flagellomere  $0.7\text{--}0.9\times$  as long as centrally broad; fore wing with vein 2m-cu rarely with a two bullae (if so abscissa without a stub on spurious vein), 2rs-m  $1.8\text{--}2.0\times$  as long as abscissa of M between 2rs-m and 2m-cu; hind wing with length of abscissa of Cu1 between Cu1 and 1A  $0.2\text{--}0.3\times$  as long as length of vein Cu1 between M and Cu1; tergite I  $2.1\text{--}2.5\times$  as long as posteriorly wide; ovipositor sheath  $2.4\text{--}2.5\times$  as long as metatibia; and, antenna black with flagellomeres 8–12, generally, entirely white and flagellomeres 13–14 (rarely 8 and/or 15) ventrally black.



**FIGURE 7.** Details of *Mnioes soqta* sp. nov. (paratype) **A.** Habitus in lateral view of female **B.** Habitus in lateral view of male (scale bars = 1 mm).

**Male** (Fore wing length 6.5–7.3 mm). The male individuals differ from the females in the following features: face 0.7–0.8× as long as wide; malar space 0.6–0.7× as long as basal mandibular width; distance between ocelli 0.6–0.7× maximum ocellar diameter; antenna with 45–47 flagellomeres, ratio of length from second to fourth flagellomeres: 4.0:3.8:3.7, subapical flagellomere 1.4–1.5× as long as centrally broad; fore wing with vein 1m-cu without a ramellus, vein 2m-cu with a single bulla and without abscissa and stub of spurious vein; hind wing with length of abscissa of Cu1 between Cu1 and 1A 0.1–0.4× as long as length of vein Cu1 between M and Cu1; tergite I 2.4–2.6× as long as posteriorly wide; tergite II 1.4–1.6× as long as posteriorly wide.

**Colour (male):** Head predominantly black; face (with a black band centrally), clypeus, malar space, mandibles, orbits (between antennal socket and median ocellus) white; antenna predominantly black, scape and pedicel latero-externally white. Mesosoma (Fig. 7A) predominantly black; anterior margin of pronotum, subalar prominence, tegula, and humeral plate white. Prothoracic leg light brown; coxa basally black, gradually changing to white towards distal end. Mesothoracic leg light brown; coxa basally black gradually changing to white towards distal end; trochanter, trochantellus, and femur latero-externally off-white; tibia ventrally off-white. Metathoracic leg predominantly black, distal end of coxa and tibia ventrally off-white, tarsomeres 2–4 white. Wings (Fig. 7A) hyaline, with apical and preapical band blackish. Metasomal tergites predominantly black, posterior margin of tergite II, anterior margin of tergite III, and mid-posterior margin of tergite VII white.

**Distribution.** Cloud forests of Cusco and Pasco (Fig. 9C), at about 1500 m.

**Etymology.** The specific epithet *soqta* means “six” in Quechua. It is treated as a masculine noun in apposition.

### ***Mnioes tawa* sp. nov.**

(Figures 8, 9C)

**Diagnosis.** *Mnioes tawa* sp. nov. can be distinguished from its female congeners by the following combination of traits: face, mesoscutum, tegula, and coxae predominantly black, at least with flagellomeres 15–17 entirely white, wings hyaline, and ovipositor sheath 2.5× as long as metatibia; while males are the only ones with mesoscutum black with reddish anterolateral marks. This species is more similar to *M. attenboroughi* sp. nov. (*vide* Remarks, *supra*).

**Material examined.** *Holotype*: ♀, “PERÚ: CU. La Convención, Echarate, CC Kitaparay 72°49’11.42”/12°12’47.73” 474m 10.xi.2009 Light. C. Espinoza y E. Rázuri” (MUSM).

*Paratypes*: CUZCO: 1♀, La Convención, Echarate, Timpia, 12°6’45.02”S/ 72°49’33.52”W, 546m, 25–31.I.2010, C. Espinoza & E. Rázuri, primary forest with pacal; 1♀, Camisea, 11°41’20.7”S/ 72°56’47”, 493m, 10.VIII.2013 V. Borda; 2♂♂, Quebrada Coentiarí 12°9’56”S/ 73°4’2.1”W, 614m, 13–16.VII.2011, A. Alfaro; 1♀, Reserva Comunal Matsigenga 12°13’33.81”S/ 73°02’6.98”W, 1297m, 3.VIII.2007, A. Asenjo (MUSM).

**Description of female holotype.** Fore wing length 8.4 mm.

**Head:** Face granulate-punctate and weakly polished, 0.7× as long as wide; clypeus dorsal half granulate-punctate, ventral half granulate, 2.0× as wide as long; malar space 0.6× as long as basal mandibular width; lateral ocellus separated from compound eye by about 1.0× maximum ocellar diameter; distance between ocelli 1.0× maximum ocellar diameter; scape with truncated section V-shaped, with 46 flagellomeres, ratio of length from second to fourth flagellomeres: 3.2:2.7:2.7, subapical flagellomere 1.1× as long as centrally broad.

**Mesosoma:** Granulate-punctate and weakly polished; notaulus vestigial, weakly impressed anteriorly; subalar prominence low and weakly rounded. Propodeum granulate-punctate; evenly declivous from anterior margin; pleural carina distinct only basally; with a weak, narrow vestige of posterior transverse carina present centrally on an elevation. Fore wing with vein 1m-cu with a ramellus; vein 2m-cu weakly sinuate, with a two bullae, with abscissa and with a stub on spurious vein; 2rs-m 2.3× as long as abscissa of M between 2rs-m and 2m-cu. Hind wing with length of abscissa of Cu1 between Cu1 and 1A 0.2× as long as length of vein Cu1 between M and Cu1.

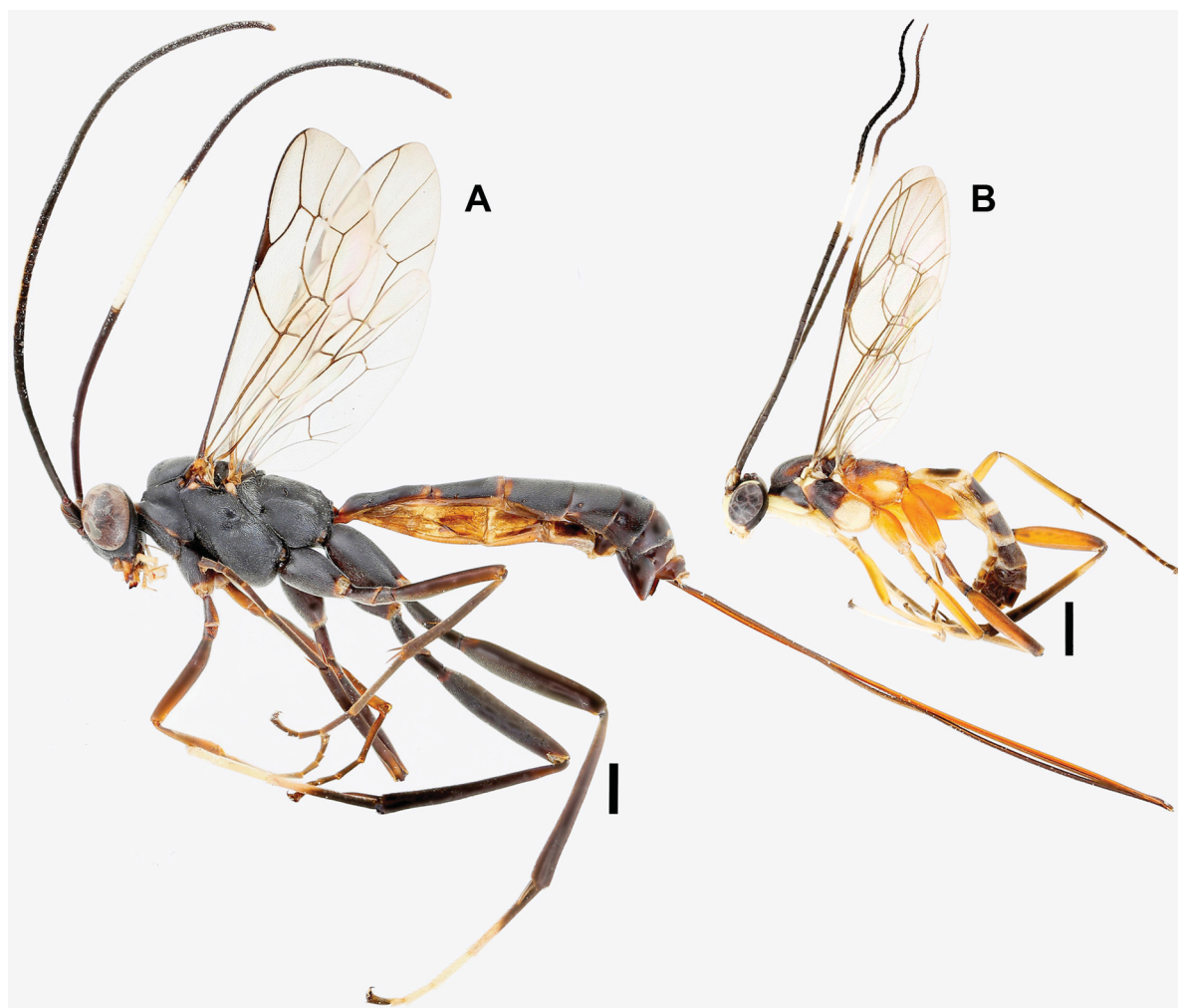
**Metasoma:** Metasomal tergites granulate, matte; tergite I 2.2× as long as posteriorly wide; tergite II 1.2× as long as posteriorly wide; ovipositor sheath 2.5× as long as metatibia.

**Colour:** Head black; mandible centrally, ventral half of clypeus, and palpi off-white; orbit (between antennal socket and median ocellus) white; antenna black with flagellomeres 8–18 dorsally white. Mesosoma (Fig. 8A) predominantly black; anterior margin of pronotum off-white (dorsally white), subalar prominence and dorsal most section of mesepisternum white; humeral plate basally white, grading distally to brown scutellum medially off-white.

Prothoracic leg with coxa black, ventrally and distal end off-white; trochanter, trochantellus, femur, and tarsus brown but ventrally light brown; tibia light brown. Mesothoracic leg black, distal end of coxa off-white. Metathoracic leg predominantly black, distal half of basitarsus and tarsomere 2–4 white. Wings hyaline. Metasomal tergites predominantly black; anterior and posterior margins of tergite I–II and anterior margin of tergite III off-white, tergites V–VII mid-posterior margin white. Ovipositor sheath black.

*Variation of female paratypes.* Fore wing length 7.9–8.8 mm. They differ from the holotype in the following features: clypeus  $1.9\text{--}2.1\times$  as wide as long; lateral ocellus separated from compound eye by about  $1.0\text{--}1.2\times$  maximum ocellar diameter; distance between ocelli  $1.0\text{--}1.1\times$  maximum ocellar diameter; antenna with 43–44 flagellomeres, ratio of length from third to fourth flagellomeres:  $2.7\text{--}2.9:2.7\text{--}2.8$ , subapical flagellomere  $1.0\text{--}1.1\times$  as long as centrally broad; fore wing with vein 2m-cu with or without a stub of spurious vein; tergite I  $2.4\times$  as long as posteriorly wide; tergite II  $1.3\text{--}1.6\times$  as long as posteriorly wide; antenna black with flagellomeres 7 or 9–17 dorsally white; and metathoracic coxa ventrally reddish. Within the coloration: antenna black with flagellomeres 7 or 9–17 dorsally white; metathoracic coxa, in some individuals, ventrally reddish.

*Male.* Fore wing length 6.0–6.4 mm. The male individuals (Fig. 8B) differ from the females in the following features: face  $0.8\times$  as long as wide; lateral ocellus separated from compound eye by about  $0.9\times$  maximum ocellar diameter; distance between ocelli  $0.7\times$  maximum ocellar diameter; antenna with 41–42 flagellomeres, ratio of length from second to fourth flagellomeres:  $3.5\text{--}3.6:3.4\text{--}3.5:3.4\text{--}3.5$ , subapical flagellomere  $2.2\text{--}2.3\times$  as long as centrally broad; propodeum without pleural carina; fore wing with vein 1m-cu without or with a small ramellus, vein 2m-cu with one long bulla and without a stub on spurious vein, 2rs-m  $1.8\times$  as long as abscissa of M between 2rs-m and 2m-cu; hind wing with length of abscissa of Cu1 between Cu1 and 1A  $0.1\times$  as long as length of vein Cu1 between M and Cu; and tergite I  $2.0\times$  as long as posteriorly wide; tergite II  $1.3\times$  as long as posteriorly wide.



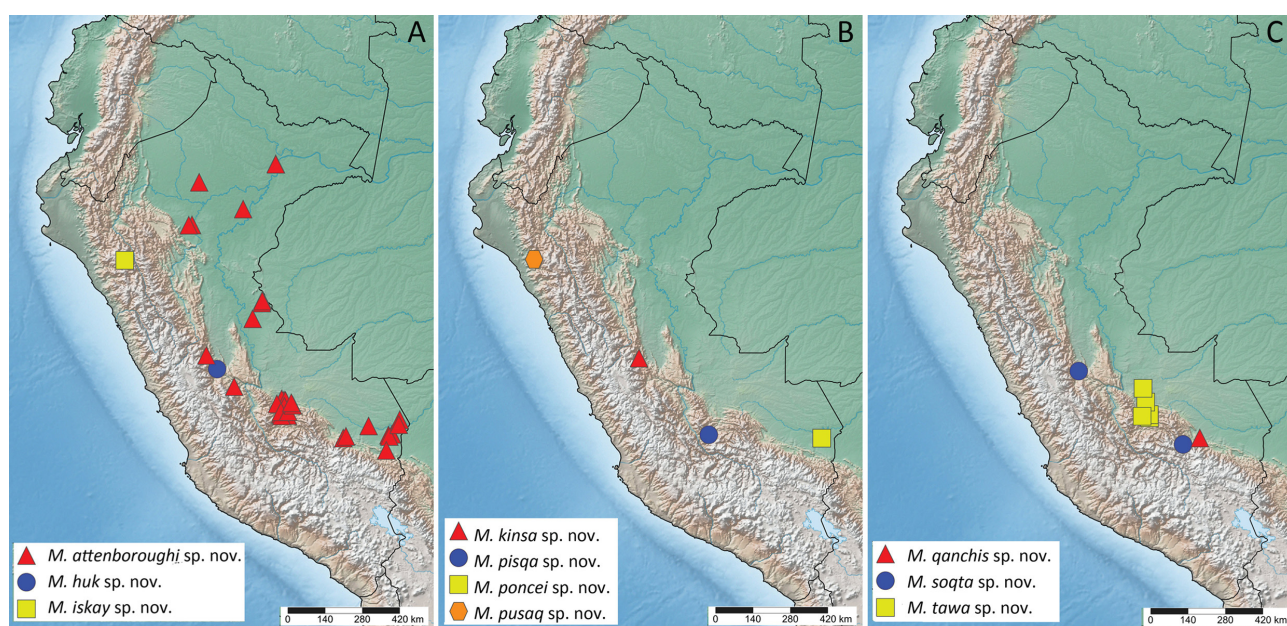
**FIGURE 8.** Details of *Mnioes tawa* sp. nov. **A.** Habitus in lateral view of female (holotype) **B.** Habitus in lateral view of male (paratype) (scale bars = 1 mm).



**Colour (male):** Head predominantly light yellow; frons centrally, vertex, gena, and occiput black; antenna predominantly black, scape and pedicel ventrally light yellow, flagellomeres black with flagellomeres 13–21 at least dorsally white and with flagellomeres 15–17 or 15–20 completely white. Mesosoma with pronotum predominantly black but anterior margin of pronotum and postero-dorsal corner light yellow; mesoscutum black with reddish anterolateral mark; mesopleuron with anterior half dark brown, mesopleuron with posterior half, subalar prominence, dorsal most section of mesepisternum, tegula and humeral plate light yellow; metapleuron orange with a light-yellow spot; propodeum orange, centrally brown. Prothoracic leg with coxa white; trochanter dorsally, trochantellus, and femur light brown; tarsus brown. Mesothoracic predominantly orange; coxa ventrally, trochanter, trochantellus, femur, and tibia off-white; tarsus light brown. Metathoracic leg with coxa orange; trochanter, trochantellus, and femur reddish brown; tibia, basal half of basitarsus, distal half of tarsomere 4 and tarsomere 5 dark brown; distal half of basitarsus, tarsomere 2–3, and basal half of tarsomere 4 white. Wings hyaline. Metasomal tergites predominantly black; tergite I–IV anterior and posterior margins off-white, posterior margins of tergite V–VII off-white or blackish (in some individuals anteriorly off-white).

**Distribution.** Cusco (Fig. 9C), between 474–1297m.

**Etymology.** The specific epithet *tawa* means “four” in Quechua. It is treated as a noun masculine in apposition.



**FIGURE 9.** Geographic distribution of the *Mnioes* species in Peru.

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## References

- Alvarado, M., Bordera, S., Rodríguez-Berrio, A & Figueroa, L. (2018) Revision of the Neotropical parasitoid wasp genus *Hapsinotus* (Hymenoptera: Ichneumonidae: Banchinae). *The Canadian Entomologist*, 150 (6), 716–801.  
<https://doi.org/10.4039/tce.2018.42>

- Alvarado, M., Rodríguez-Berrío, A. & Bordera S. (2010) Colección de Ichneumonidae (Hymenoptera) del Museo de Entomología 'Klaus Raven B.' y del Museo de Historia Natural de la UNMSM, Perú. *In*: Toledo, V.H., Corona, A.M., Flores, A.P., Tovar, E., Coronado, J.M. & Ruíz-Cancino, E. (Eds.), *II Taller Internacional de Recursos Naturales*. Red de Cuerpos Académicos, México, D.F., pp. 1–107.
- Broad, G.R., Sääksjärvi, I.E., Veijalainen, A. & Notton, D.G. (2011) Three new genera of Banchinae (Hymenoptera: Ichneumonidae) from Central and South America. *Journal of Natural History*, 45, 1311–1329.  
<https://doi.org/10.1080/00222933.2011.552809>
- Broad, G.R., Shaw, M.R. & Fitton, M.G. (2018) *Ichneumonid wasps (Hymenoptera: Ichneumonidae): their classification and biology*. *RES Handbooks for the Identification of British Insects*. Vol. 7. No. 12. Royal Entomological Society, London, 418 pp.
- Quicke, D.L. (2015) *The braconid and ichneumonid parasitoid wasps: biology, systematics, evolution and ecology*. Wiley Blackwell, Chichester, 704 pp.  
<https://doi.org/10.1002/9781118907085>
- Shorthouse, D.P. (2010). SimpleMappr, an online tool to produce publication-quality point maps. Available from [www.simple-mappr.net](http://www.simple-mappr.net) (accessed 1 August 2019)
- Townes, H.K. (1970). The genera of Ichneumonidae. Part 3. *Memoirs of the American Entomological Institute*, 13, 1–307.
- Ugalde-Gómez, J. & Gauld, I.D. (2002) Tribe Atrophini. *In*: Gauld, I.D., Godoy, C., & Ugalde-Gómez, J. (Ed.), *The Ichneumonidae of Costa Rica 4. Memoirs of the American Entomological Institute*. Vol. 66. American Entomological Institute, Gainesville, Florida, pp. 306–666.